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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,850	06/27/2005	Alexander Hofmann	HOFMANN10	2360

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EXAMINER	
MCNALLY, DANIEL	

ART UNIT	PAPER NUMBER
1791	

MAIL DATE	DELIVERY MODE
10/01/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/540,850	HOFMANN ET AL.	
	Examiner	Art Unit	
	DANIEL MCNALLY	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 January 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *17,20 and 22-35* is/are pending in the application.

4a) Of the above claim(s) *25-33* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17,20,22-24,34 and 35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/17/2009, 2/3/2010 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 17, 20, 22, 23, 24, 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beer et al. [US2002/0104614, herein "Beer"] in view of Sonntag [DE20001033U1].

Beer discloses a method of contour welding three dimensional thermoplastic molded articles. The method comprises moving a laser absorptive join partner (half-tray 2) and a laser transmissive join partner (half-tray 1) into contact with one another in the vicinity of an outline that is to be welded, exposing the partner (2) to radiation (8) in a welding area (4) by a laser welding beam (8) and transmitting the beam through the partner(1) to join the partners (1,2) (paragraphs 0006, 0009, 0010, 0013, 0019, 0021).

Beer is silent as to additionally and simultaneously exposing the partner (1) in the weld area to an electromagnetic secondary radiation from a source different from a laser selected from IR or UV radiation for selective temperature increase of the welding area such that the temperature field in the weld area is homogenized with respect to the molten phase and the inter-layer plasticizing zone, wherein the secondary radiation has beam fraction that deviate from the wavelength of the laser beam.

Sonntag discloses an improved method and apparatus for welding. Sonntag discloses the disadvantages of using only a laser or polychromatic light source alone (pages 2-4). Sonntag discloses using a combination of a laser source and a polychromatic light source to heat a treated surface (pages 5-6). Sonntag discloses a list of benefits realized from using a combination of laser beam and polychromatic light treatment (page 7). Sonntag discloses using a combination of laser and polychromatic light results in a favorable temperature distribution in the treated spot. Sonntag discloses the polychromatic light preheats the surface to be treated, while the polychromatic light is irradiated onto the surface the laser is activated and a laser beam is simultaneously irradiated onto the surface (page 9). Because the polychromatic light source includes radiation with multiple wavelengths, at least a fraction of the radiation has a wavelength that deviates from the wavelength of the laser beam.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the method of Beer by simultaneously irradiating the weld area with a laser beam and a polychromatic light as taught by Sonntag in order to realize a more favorable temperature distribution in the weld. One of ordinary skill would appreciate

the simultaneous irradiation would result in heating of the transparent partner resulting in a more homogeneous temperature field in the irradiated area.

With regard to claim 20, Sonntag discloses the secondary radiation is IR radiation which includes short wave IR (pages 2 and 4).

With regard to claim 22, Sonntag discloses that the secondary radiation is initiated ahead of the laser beam (pages 6, 9, Figure 1).

With regard to claim 23, Sonntag discloses the secondary radiation is focused (page 9; Figure 1).

With regard to claim 24, Beer discloses the radiation is applied by a clamping device (6) that is transmissive to the laser beam (paragraph 0019).

With regard to claim 34, applicant is referred to the discussion of claim 17 above. Additionally, the use of the two radiation sources as taught by Sonntag will result in a homogeneous weld on both sides of the weld level.

With regard to claim 35, Sonntag discloses the secondary radiation is applied substantially concentrically and synchronously with the laser beam (Figure 2).

4. Claims 17, 20, 22, 23, 24, 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muellich [US5893959] in view of Sonntag.

Muellich discloses a method of contour welding three dimensional thermoplastic molded articles. The method comprises moving a laser absorptive join partner (base 7) and a laser transmissive join partner (cover 8) into contact with one another in the vicinity of an outline that is to be welded, exposing the partner (7) to radiation (11) in a welding area (10) by a laser welding beam (11) and transmitting the beam through the

partner (8) to join the partners (7, 8) (column 4, line 36 – column 5, line 34). Muellich is silent as to additionally and simultaneously exposing the partner (7) in the weld area to an electromagnetic secondary radiation from a source different from a laser selected from IR or UV radiation for selective temperature increase of the welding area such that the temperature field in the weld area is homogenized with respect to the molten phase and the inter-layer plasticizing zone, wherein the secondary radiation has beam fraction that deviate from the wavelength of the laser beam.

Sonntag discloses an improved method and apparatus for welding. Sonntag discloses the disadvantages of using only a laser or polychromatic light source alone (pages 2-4). Sonntag discloses using a combination of a laser source and a polychromatic light source to heat a treated surface (pages 5-6). Sonntag discloses a list of benefits realized from using a combination of laser beam and polychromatic light treatment (page 7). Sonntag discloses using a combination of laser and polychromatic light results in a favorable temperature distribution in the treated spot. Sonntag discloses the polychromatic light preheats the surface to be treated, while the polychromatic light is irradiated onto the surface the laser is activated and a laser beam is simultaneously irradiated onto the surface (page 9). Because the polychromatic light source includes radiation with multiple wavelengths, at least a fraction of the radiation has a wavelength that deviates from the wavelength of the laser beam.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the method of Muellich by simultaneously irradiating the weld area with a laser beam and a polychromatic light as taught by Sonntag in order to realize a

more favorable temperature distribution in the weld. One of ordinary skill would appreciate the simultaneous irradiation would result in heating of the transparent partner resulting in a more homogeneous temperature field in the irradiated area.

With regard to claim 20, Sonntag discloses the secondary radiation is IR radiation which includes short wave IR (pages 2 and 4).

With regard to claim 22, Sonntag discloses that the secondary radiation is initiated ahead of the laser beam (pages 6, 9, Figure 1).

With regard to claim 23, Sonntag discloses the secondary radiation is focused (page 9; Figure 1).

With regard to claim 24, Muellich discloses the radiation is applied by a clamping device (16) that is transmissive to the laser beam (column 8, lines 13-37).

With regard to claim 34, applicant is referred to the discussion of claim 17 above. Additionally, the use of the two radiation sources as taught by Sonntag will result in a homogeneous weld on both sides of the weld level.

With regard to claim 35, Sonntag discloses the secondary radiation is applied substantially concentrically and synchronously with the laser beam (Figure 2).

5. Claims 17, 20, 22, 23, 24, 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen al. [US2003/0213552, herein "Chen"] in view of Sonntag.

Chen discloses a method of contour welding three dimensional thermoplastic molded articles. The method comprises moving a laser absorptive join partner (14) and a laser transmissive join partner (13) into contact with one another in the vicinity of an

outline that is to be welded, exposing the partner (14) to radiation (12) in a welding area (14) by a laser welding beam (12) and transmitting the beam through the partner (13) to join the partners (13, 14) (paragraphs 0021, 0029). Chen is silent as to additionally and simultaneously exposing the partner (1) in the weld area to an electromagnetic secondary radiation from a source different from a laser selected from IR or UV radiation for selective temperature increase of the welding area such that the temperature field in the weld area is homogenized with respect to the molten phase and the inter-layer plasticizing zone, wherein the secondary radiation has beam fraction that deviate from the wavelength of the laser beam.

Sonntag discloses an improved method and apparatus for welding. Sonntag discloses the disadvantages of using only a laser or polychromatic light source alone (pages 2-4). Sonntag discloses using a combination of a laser source and a polychromatic light source to heat a treated surface (pages 5-6). Sonntag discloses a list of benefits realized from using a combination of laser beam and polychromatic light treatment (page 7). Sonntag discloses using a combination of laser and polychromatic light results in a favorable temperature distribution in the treated spot. Sonntag discloses the polychromatic light preheats the surface to be treated, while the polychromatic light is irradiated onto the surface the laser is activated and a laser beam is simultaneously irradiated onto the surface (page 9). Because the polychromatic light source includes radiation with multiple wavelengths, at least a fraction of the radiation has a wavelength that deviates from the wavelength of the laser beam.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the method of Chen by simultaneously irradiating the weld area with a laser beam and a polychromatic light as taught by Sonntag in order to realize a more favorable temperature distribution in the weld. One of ordinary skill would appreciate the simultaneous irradiation would result in heating of the transparent partner resulting in a more homogeneous temperature field in the irradiated area.

With regard to claim 20, Sonntag discloses the secondary radiation is IR radiation which includes short wave IR (pages 2 and 4).

With regard to claim 22, Sonntag discloses that the secondary radiation is initiated ahead of the laser beam (pages 6, 9, Figure 1).

With regard to claim 23, Sonntag discloses the secondary radiation is focused (page 9; Figure 1).

With regard to claim 24, Chen discloses the radiation is applied by a clamping device (17) that is transmissive to the laser beam (paragraph 0012).

With regard to claim 34, applicant is referred to the discussion of claim 17 above. Additionally, the use of the two radiation sources as taught by Sonntag will result in a homogeneous weld on both sides of the weld level.

With regard to claim 35, Sonntag discloses the secondary radiation is applied substantially concentrically and synchronously with the laser beam (Figure 2).

Response to Arguments

6. Applicant's arguments with respect to claims 17, 20, 22, 23, 24, 34 and 35 have been considered but are moot in view of the new ground(s) of rejection.

Applicant the previously cited prior art did not disclose simultaneously irradiating a laser beam and a radiation from a source different from a laser onto the weld area to achieve the homogeneous temperature field at the weld. Newly cited Sonntag discloses using a combination of laser and polychromatic light sources to irradiate a surface to achieve a beneficial temperature distribution.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL MCNALLY whose telephone number is (571)272-2685. The examiner can normally be reached on Monday - Friday 8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Daniel McNally/
Examiner, Art Unit 1791

/John L. Goff/
Primary Examiner, Art Unit 1791

DPM
September 29, 2010